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Montana Department of Health
and Environmental Sciences
Solid and Hazardous Waste Bureau

**GROUND WATER SAMPLING PLAN
LIVINGSTON RAIL YARD
LIVINGSTON, MONTANA**

Submitted to:

**Montana Department of Health and
Environmental Sciences**
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1.0 INTRODUCTION

The Livingston aquifer is an alluvial aquifer composed of coarse-grained sand and gravel and is located along the Yellowstone River within and adjacent to the city of Livingston. A plume of volatile organic compounds (VOCs) is present within the Livingston aquifer, extending from the shop complex of the Livingston Rail Yard (LRY) northeastward to the Yellowstone River.

Ground water investigations summarized in the Draft Remedial Investigation (RI) Report for the LRY show that ground water in the Livingston aquifer flows northeastward beneath the LRY. The vertical and lateral extent of the VOC plume has been defined by three years of monthly, quarterly, and yearly ground water sampling at up to 50 monitoring and municipal wells within and around the LRY. The extent and magnitude of the VOC plume have been accurately characterized through all seasons. The results of this investigation are summarized in the Draft RI Report, issued on September 12, 1991.

This work plan describes a modified ground water sampling program designed to monitor the boundaries of the VOC plume, to monitor points of public water use and the effectiveness of source control measures quarterly, and to fulfill the data requirements for the ongoing feasibility studies of remedial alternatives at the LRY. This work plan replaces the original ground water monitoring program outlined in Amendment 5-2 to the Interim Remedial



Measures Work Plan. This work plan will continue to be updated based upon the changing objectives of ground water monitoring.

2.0 GROUND WATER SAMPLING SCHEDULE

The Final Remedial Investigation Report will be issued during 1992 after completion of additional work suggested by the MDHES. Additional field work associated with ground water sampling consists of sampling for the presence of dense, non-aqueous-phase liquids at the Electric Shop and installing and sampling a monitoring well on the east side of the Yellowstone River across from the LRY.

The modified ground water sampling plan is designed to measure ground water contaminants migrating from the LRY for:

- Protection of human health and the environment, and
- Monitoring the effectiveness of the existing and future source control measures.

Table 1.0 shows the quarterly and annual ground water sampling schedule. The quarterly schedule is specifically designed to monitor source-control impacts and VOC plume boundaries. The annual sampling round will provide a complete picture of the magnitude and boundaries of the VOC plume. The annual sampling round will be conducted during May. Water-level measurements listed on Table 1.0 will be taken semiannually during August and February. Product thickness measurements will be measured quarterly for those wells within the diesel plume.



TABLE 1.0

Ground Water Sample Schedule
Livingston Rail Yard, Livingston, Montana

SAMPLE LOCATION	PURPOSE	QUARTERLY	SEMIANNUAL	ANNUAL	WATER-LEVEL MEASUREMENTS	
						SEMIANNUAL
LS-6	HHE			X		X
LS-8	SCM	X	X	X		X
LS-11	SCM	X	X	X		X
L-87-2	SCM	X	X	X		X
L-87-3	SCM	X	X	X		X
L-87-4	HHE			X		X
L-87-5	SCM	X	X	X		X
L-87-7	HHE			X		X
L-87-8	HHE	X	X	X		X
L-88-9	HHE			X		X
L-88-10	HHE	X	X	X		X
L-88-13	HHE			X		X
1	HHE		X	X		X
2	HHE		X	X		X
3	HHE			X		X
4	HHE			X		X
5	HHE	X	X	X		X
6	HHE		X	X		X
7	HHE			X		X
8	HHE			X		X
89-1	HHE			X		X
89-2	HHE	X	X	X		X
89-3	SCM	X	X	X		X
89-4	HHE	X	X	X		X
89-6	HHE			X		X
89-7	HHE			X		X
89-9	SCM	X	X	X		X
89-10	SCM			X		X
90-2B	SCM			X		X
90-3	HHE			X		X
90-6	SCM	X	X	X		X
92-1	SCM	X	X	X		X
92-2	HHE	X	X	X		X
92-3	HHE	X	X	X		X
92-4	HHE	X	X	X		X
B STREET	HHE			X		X
RAINBOW	HHE			X		X

Note:

SCM - Source Control Monitoring

HHE - Human Health and Environment

3.0

GROUND WATER SAMPLE ANALYSES

All ground water samples will be analyzed for purgeable halocarbons by EPA Method 601, with the exception of those from Wells LS-6, LS-11, L-87-2, L-87-4, L-87-7, L-87-8, and L-88-10, which will be analyzed for regulated and unregulated VOCs by EPA Method 524.2 during the annual sampling round.

4.0

REPORTING

Letter reports summarizing the ground water sample results will be provided to the Montana Department of Health and Environmental Sciences (MDHES) after each sampling round. The letter reports will include tables comparing the sample results with those of the previous three quarterly sampling rounds, QA/QC evaluations for the sample results, and an interpretation of any significant variations from previous sampling rounds. All results will be entered into the database as they become available to Envirocon. The MDHES will be sent updated database files quarterly.

